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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,983	12/31/2001	Seong-Jae Hong	9903-039	5318

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EXAMINER

NGUYEN, DONGHAID

ART UNIT PAPER NUMBER

3729

DATE MAILED: 02/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/036,983

Applicant(s)

HONG ET AL.

Examiner

Donghai D. Nguyen

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/4/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

2. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There are many phrases in the claims are vague and indefinite: for example, the phrase "said gap" (claim 1, line 10) or "the gap" (claim 9, line 8) is vague and indefinite since it is unclear as to which one of the recited gaps is referred to, or the phrase "is able to fill" is vague and indefinite since it is uncertain that the fill material positively fill the gaps or not, etc.

3. Claims 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: mounting the semiconductor chips onto the substrates, filling the gaps with filling material, or applying suction to the sub-duct, etc.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 3729

5. Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,048,656 to Akram et al in view of US Patent 6,253,834 B1 to Sterner.

Regarding claim 1, Akram et al disclose an underfill system for filling gaps between semiconductor chips and substrates, comprising: an air duct (160) which including an inlet (164) of the sub-ducts (160) to be disposed on one side of the semiconductor chip (110), and wherein a filling material (190) from a dispenser (150) is able to fill the gap (180) by suction due to a pressure difference between the main duct and the sub-duct (Col. 6, lines 45-49). However, Akram et al do not specifically disclose the vacuum source (Abstract line 1) having a blower configured to blow air into the air duct, wherein the air duct includes a main duct coupled to the blower, and a plurality of sub-ducts each having an outlet being coupled to the main duct.

Sterner teaches the blower (100) configured to blow air into the air duct (15), wherein the air duct includes a main duct (150) coupled to the blower, and a plurality of sub-ducts (120) each having an outlet being coupled to the main duct (Figs. 5, 8, etc.) for forming a vacuum air flow, "suction" from the inlet of the sub-duct to the main duct (Fig. 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Akram et al's vacuum source to have a blower configured to blow air into the air duct, wherein the air duct includes a main duct coupled to the blower, and a plurality of sub-ducts each having an outlet being coupled to the main duct as taught by Sterner for forming the vacuum air flow, "suction" for the inlet of the sub-duct to the main duct.

Regarding claim 2, see Fig. 3 of Akram et al

Art Unit: 3729

Regarding claims 6-8, Sterner disclose the blower comprises a fan-type blower except comprising a hydraulic-type blower or a pneumatic-type blower. It would have been an obvious matter of design choice to one having ordinary skill in the art at the time the invention was made to choose any type of blower comprising the hydraulic-type blower or the pneumatic-type blower, since Applicants have not disclosed the that claimed specifics type of blower comprising the hydraulic-type blower or the pneumatic-type blower, solves any stated problem or is for any particular purpose and it appears the invention would perform with blower of Sterner.

Regarding claim 9, Akram et al disclose a method for filling gaps between semiconductor chips and substrates, the method comprising: placing a substrate (100) in the suction of one of the sub-ducts (160); and providing a filling material (190) to the gap (180) from a dispenser (150), the filling material provided in a direction toward the inlet of the one of the sub-ducts (Figs. 3-4). However Akram et al do not disclose using a blower structured to blow air, an air duct coupled to the blower, the air duct comprising: a main duct connected to the blower; and a plurality of sub-ducts each having an outlet being connected to the main duct and an inlet.

Sterner teaches the blower (100), the air duct (15) coupled to the blower, the air duct comprising: the main duct (150/154) connected to the blower; and the plurality of sub-ducts (120) each having the outlet being connected to the main duct and the inlet (Figs. 5, 7, etc.) for creating a vacuum air flow, "suction" from the inlet of the sub-duct to the main duct (Fig. 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Akram et al to have the blower, the air duct coupled to the blower, the air duct comprising: the main duct connected to the blower; and the plurality of sub-ducts each having

Art Unit: 3729

the outlet being connected to the main duct and the inlet as taught by Sterner for forming the vacuum air flow, "suction" for the inlet of the sub-duct to the main duct.

Regarding claims 3, 4 and 10, Akram et al disclose a control device, "a timer", for controlling pressure, "air blown", except a specific valve is located on the main duct between the blower and the sub-ducts. However Sterner teaches the valve (410) is located on the main duct between the blower and the sub-ducts for block air blown from the blower into the main duct (Fig. 9). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Akram et al' control device to have the valve is located on the main duct between the blower and the sub-ducts as taught by Sterner for block air blown from the blower into the main duct

Regarding to claim 5, Akram et al do not disclose the air blown temperature; however, Sterner discloses the air blown from the blower is at a temperature of approximately 25 degrees Celsius or higher for controlling the suction rate (Col. 6, line 23-27). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Akram et al to have the air blown from the blower is at a temperature of approximately 25 degrees Celsius or higher as taught by Sterner for controlling the suction rate.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


Art Unit: 3729

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghai D. Nguyen whose telephone number is (703) 305-7859. The examiner can normally be reached on Monday-Friday (9:00-6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter D. Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DN



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